Water Conditions Summary

Operations Control and
Technical Support Department

Operations & Maintenance Resource Area

Governing Board Presentation

July 11, 2002

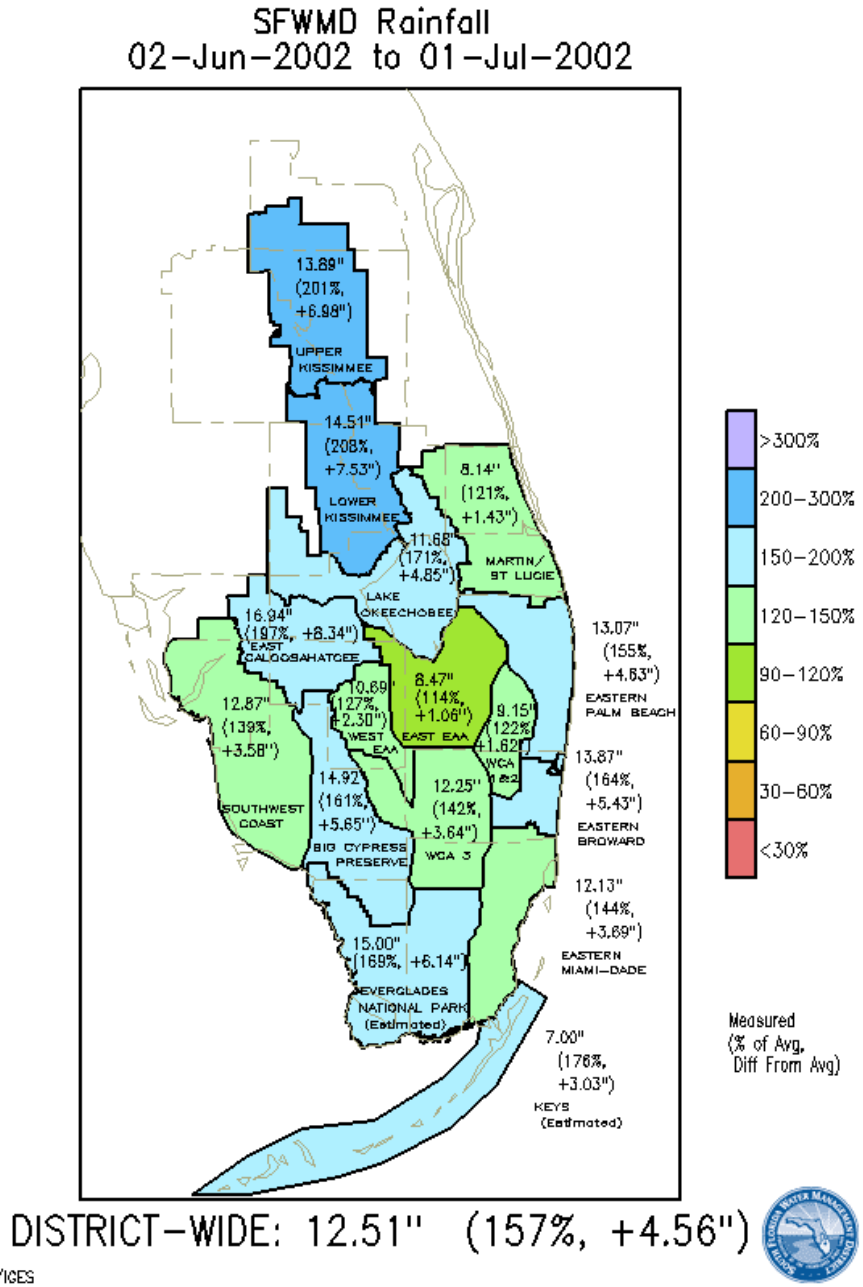
Meteorological Conditions

Governing Board Presentation - July 11, 2002

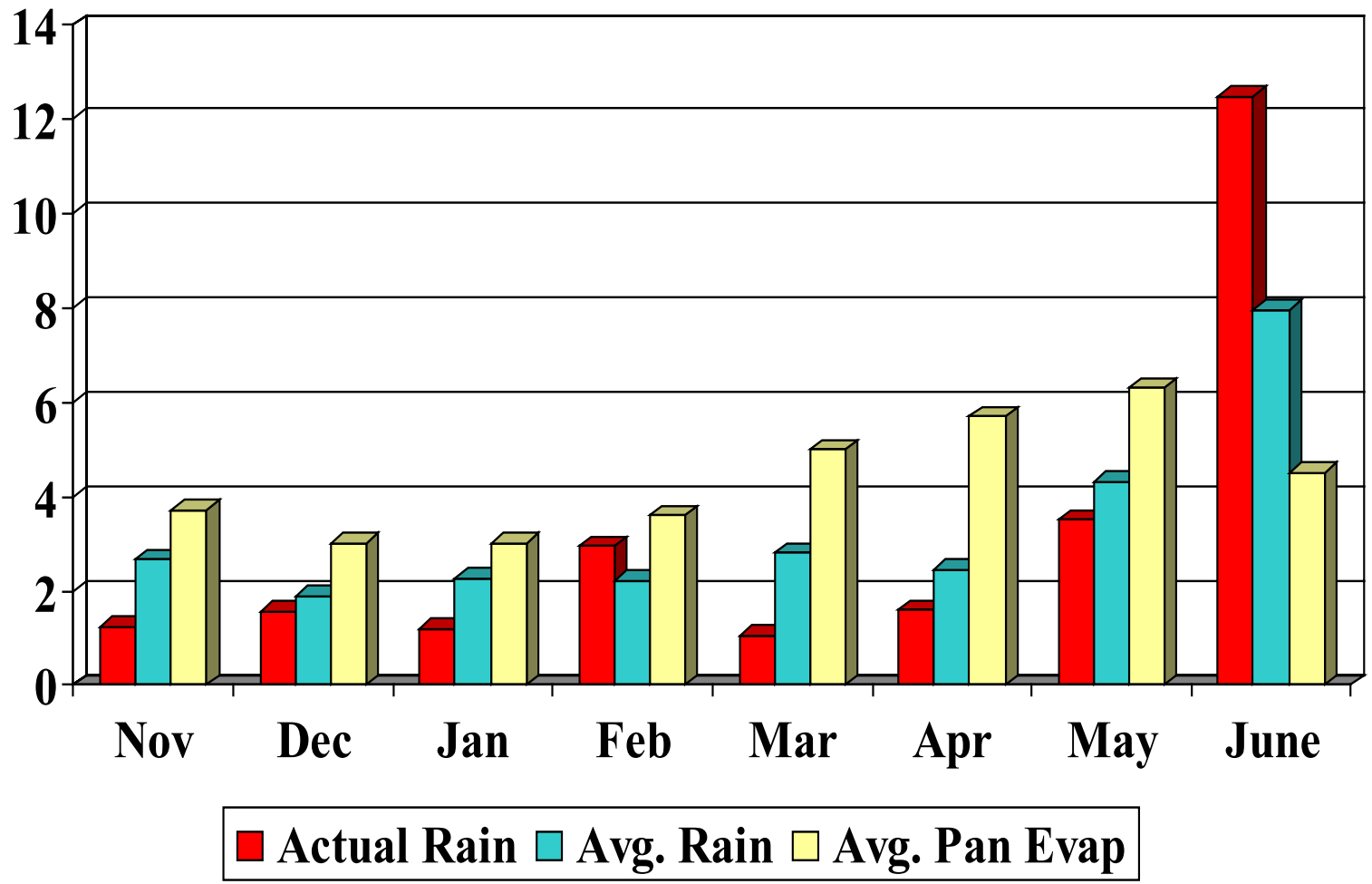
Meteorological Conditions

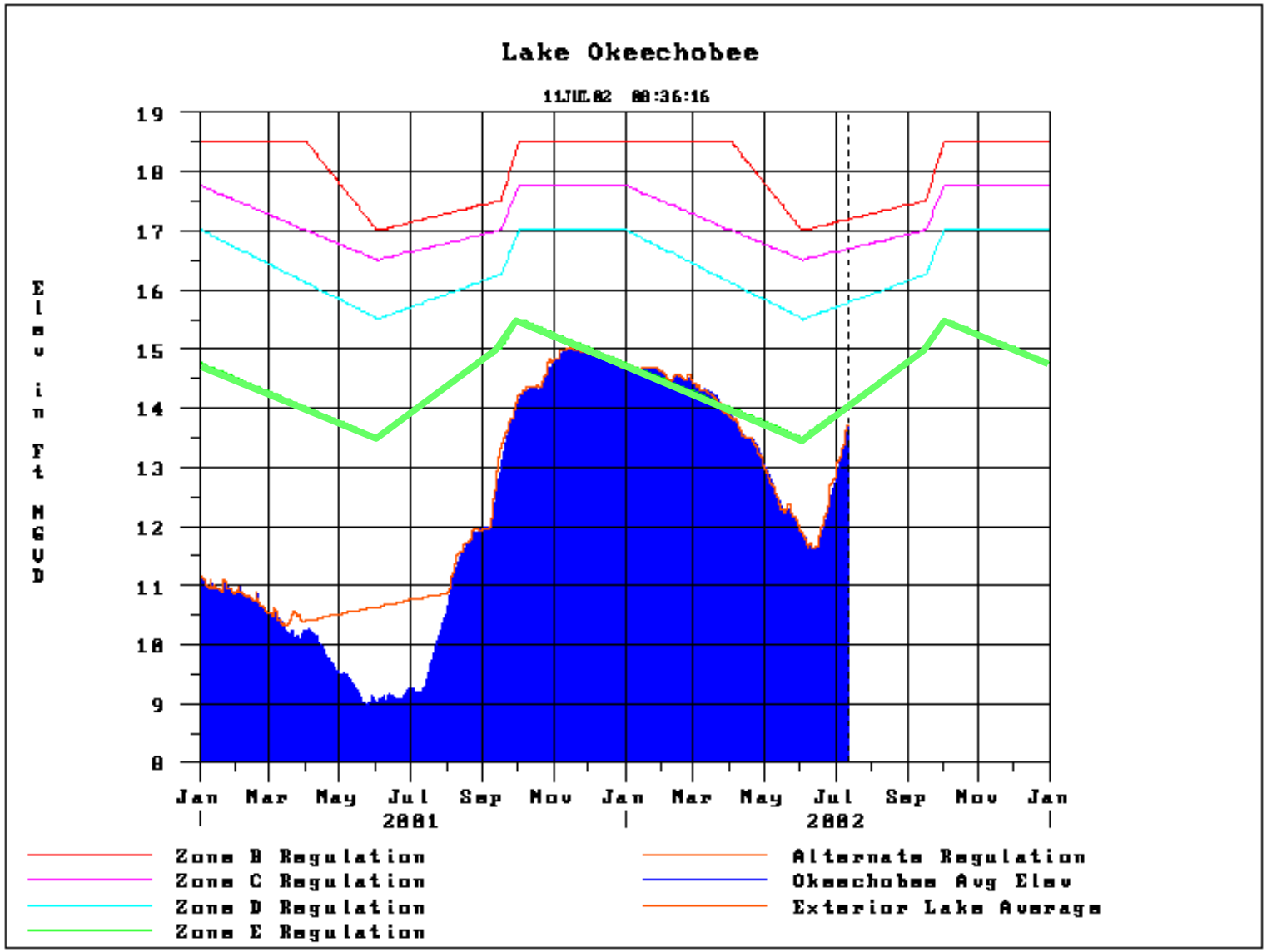
- **June broke the trend of below average monthly rainfall experienced over the 2001 - 2002 dry season**
- June Rainfall : District-wide rainfall was 157% of average
  - Normal Rainfall: 7.95 inches
  - Actual Rainfall: 12.49 inches
  - Est. Pan Evaporation: 5.40 inches
- July Rainfall : To-date District-wide rainfall is 178% of average

- June exhibited well above average rainfall over most of the District.
- Kissimmee basins received over 200% of normal rainfall
  - In the Lower Kissimmee Basin, rainfall exceeded the 100 yr-30 day return frequency
  - 3 gages had 20-22" of rain in Highlands and Glades counties this June



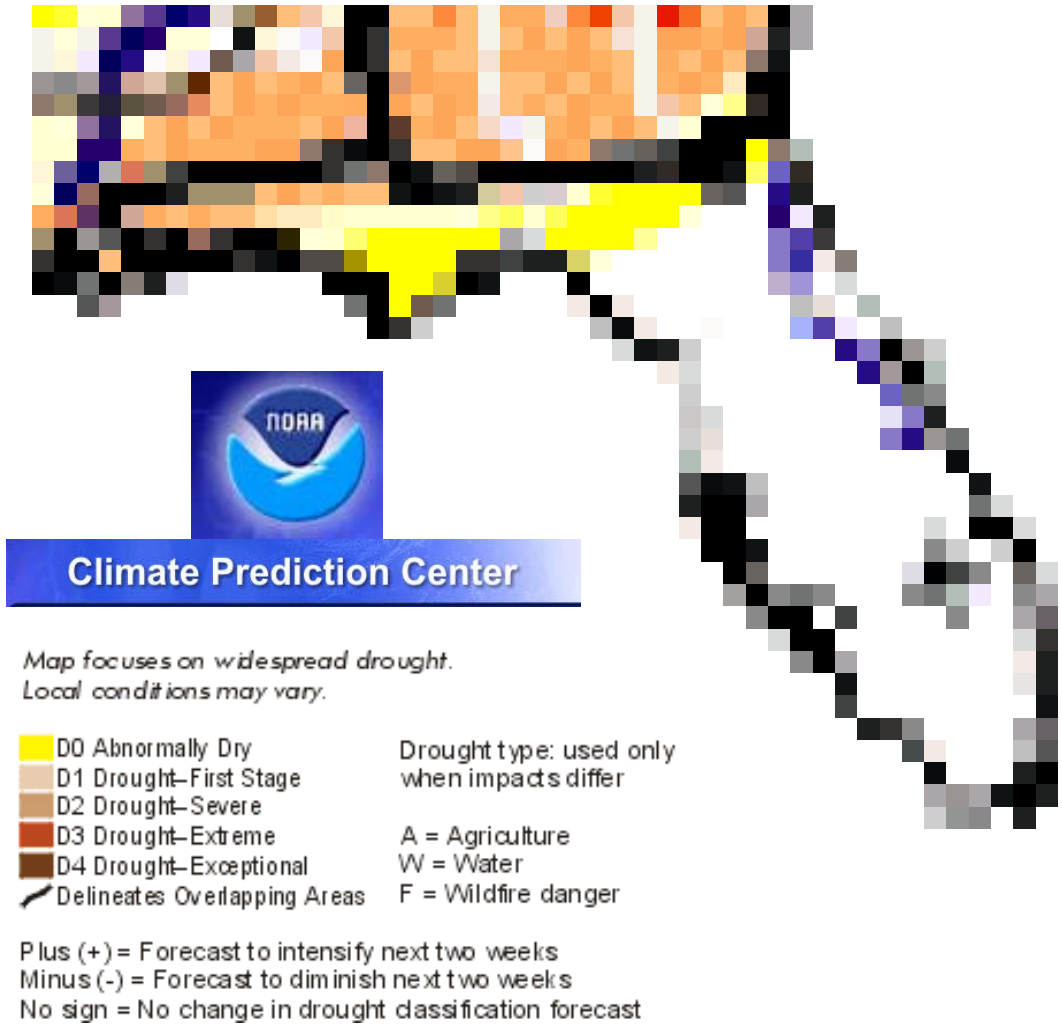
2001 / 2002 Monthly Rainfall & Evaporation




Lake Okeechobee
11/11.02 08:36:16
Elev in Ft NGVD
19
18
17
16
15
14
13
12
11
10
9
8
Jan
Mar
May
Jul
Sep
Nov
Jan
Mar
May
Jul
Sep
Nov
Jan
2001
2002
Zone B Regulation
Zone C Regulation
Zone D Regulation
Zone E Regulation
Alternate Regulation
Okeechobee Avg Elev
Exterior Lake Average

Current Climate Conditions

- Normal hydrologic conditions are indicated across the District in the latest CPC drought outlook



General Hydrologic Conditions

Governing Board Presentation - July 11, 2002

General Hydrologic Conditions

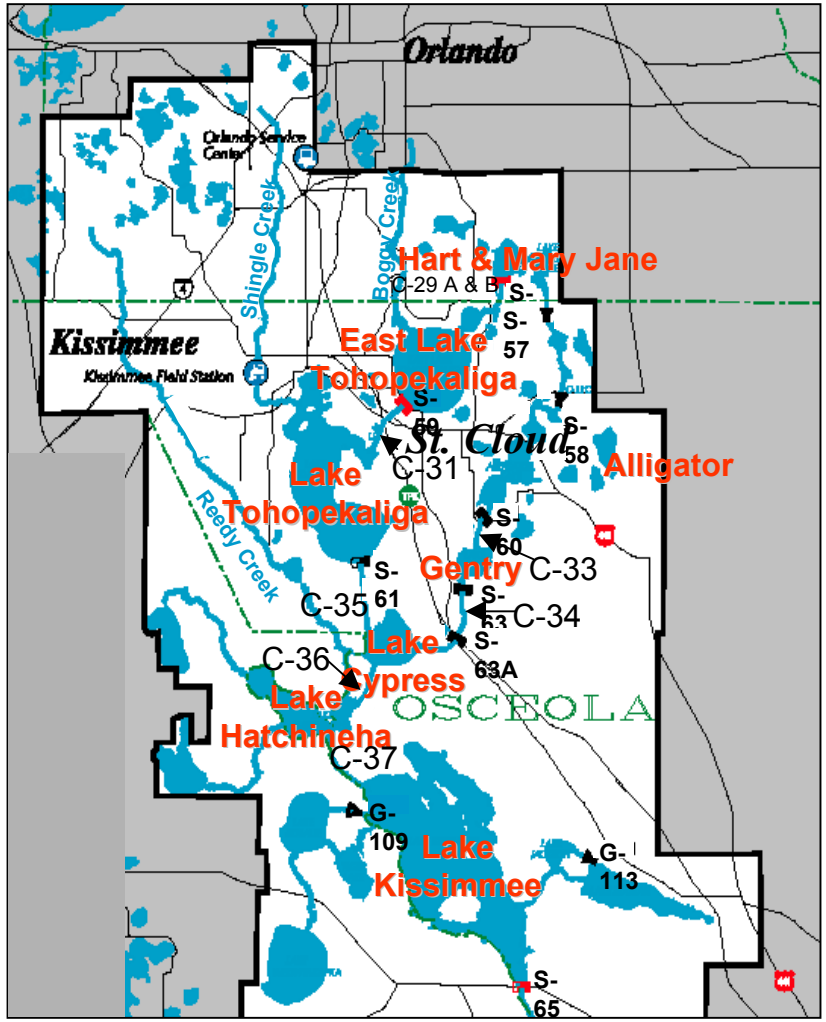
- Y **Upper Chain** - High seasonal levels
- G **Kissimmee River** - Normal seasonal levels
- G **Lake Okeechobee** - Normal seasonal levels
- G **Lake Okeechobee Agriculture**
- Y **Estuaries** - Very low salinity due to recent rainfall

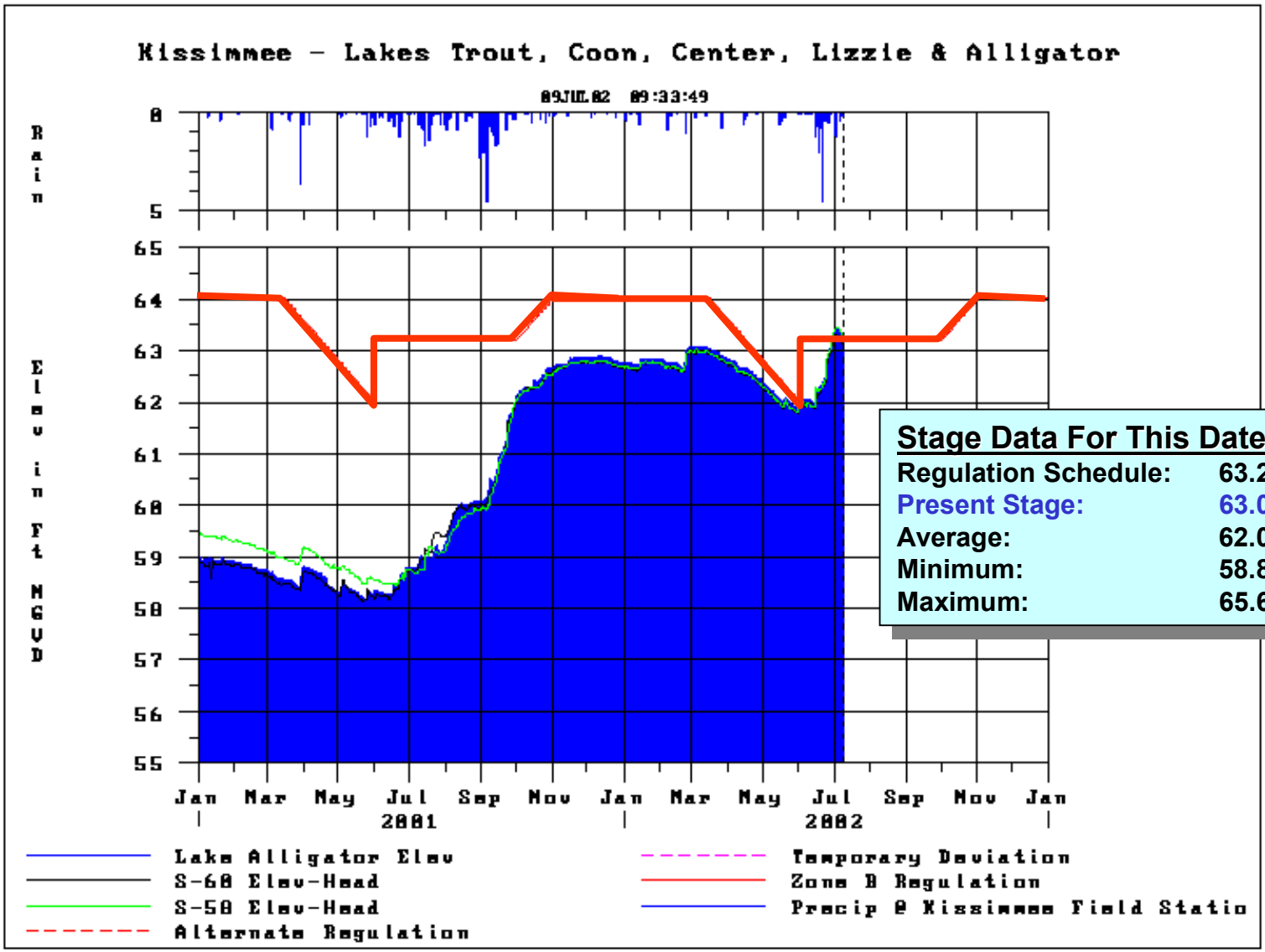
General Hydrologic Conditions

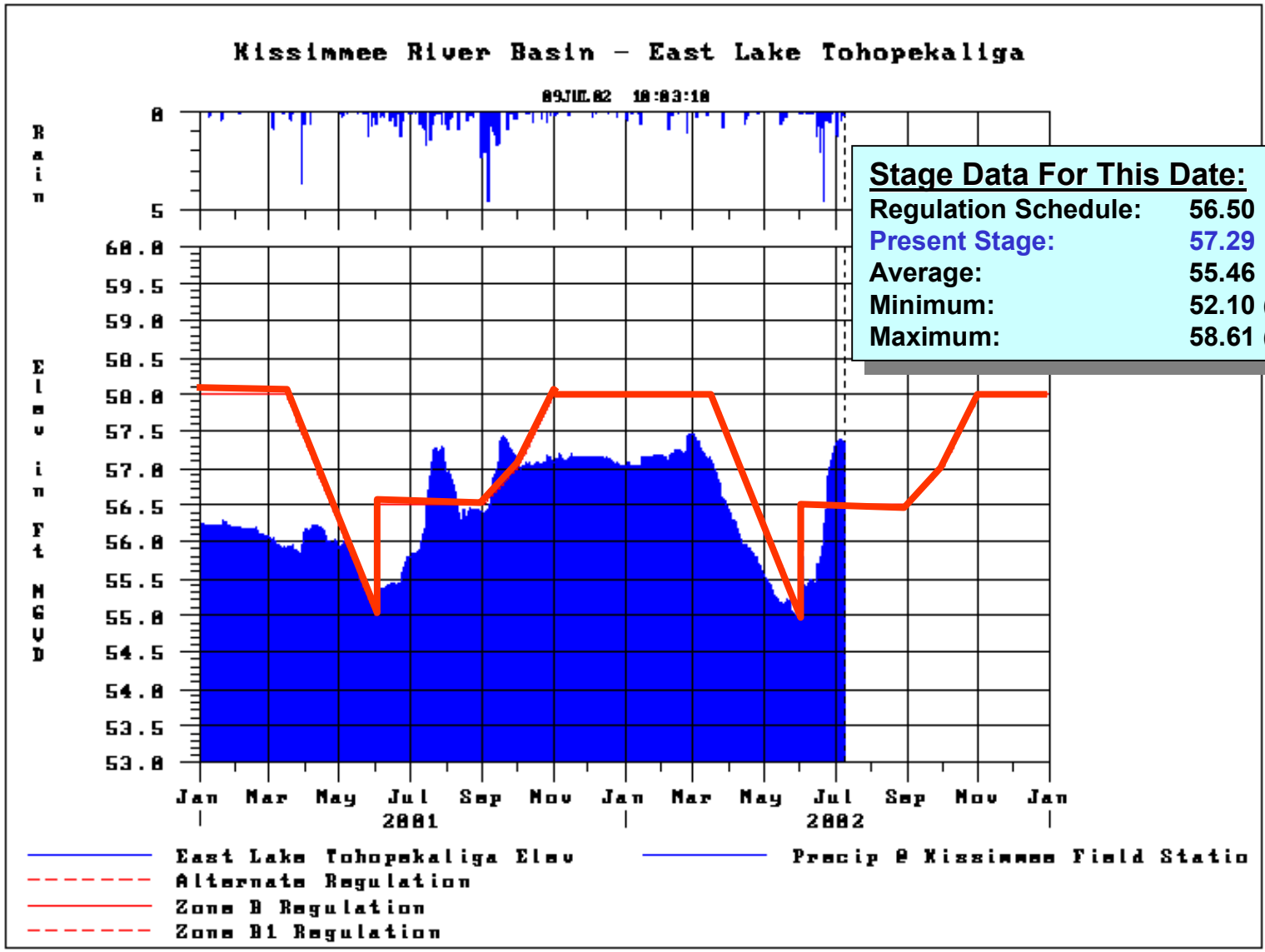
- **Water Conservation Area 1** - >Norm. Stages
- **Water Conservation Area 2** - >Norm. Stages
- **Water Conservation Area 3** - >Norm. Stages
- **ENP** - Normal seasonal conditions
- **Fl. Bay** - Normal seasonal conditions
- **Upper East Coast** - Norm. canal levels
- **Lower East Coast** - Norm. groundwater
- **Lower West Coast** - Norm. groundwater

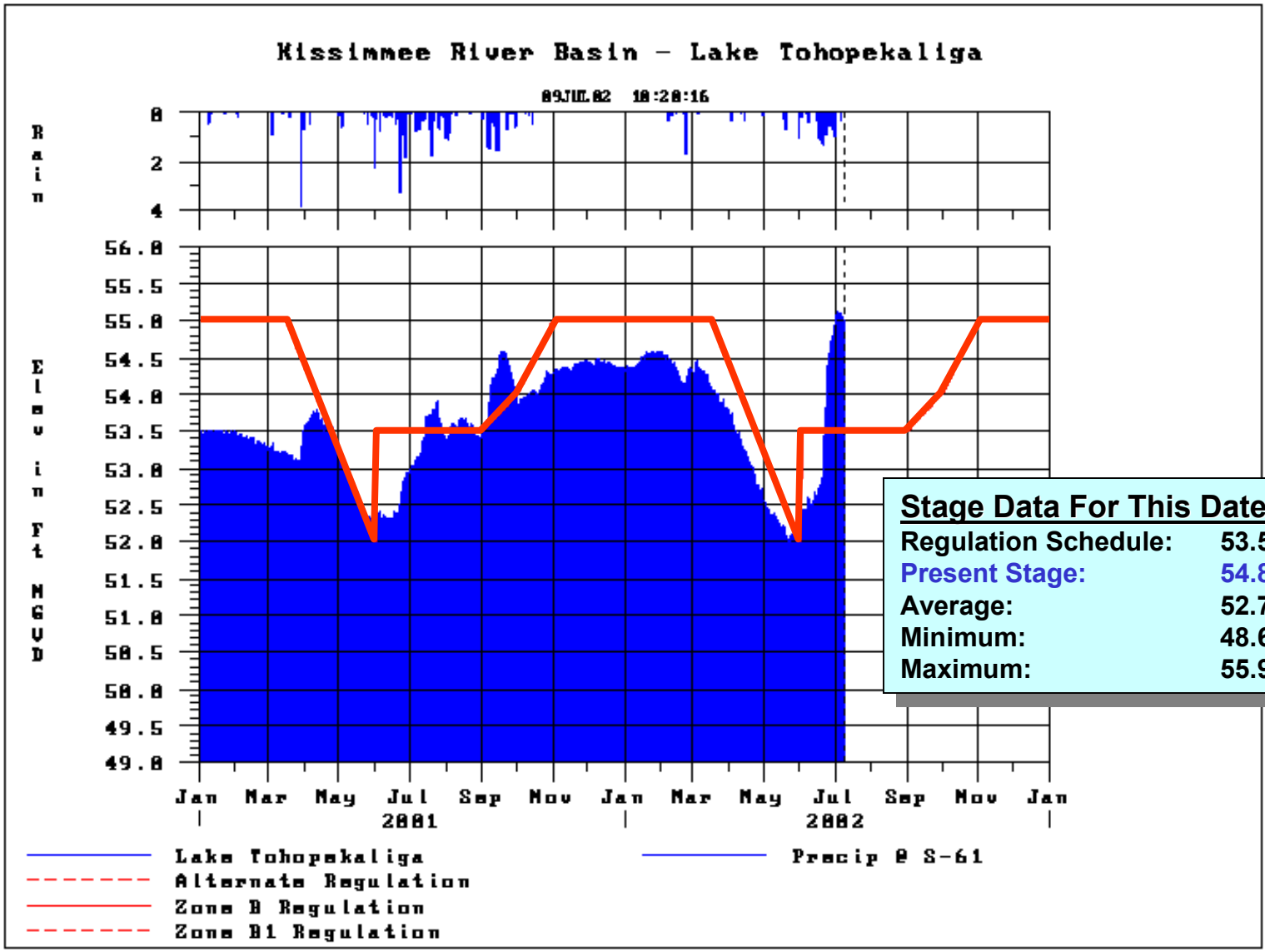
Hydrologic Conditions
Upper Kissimmee Basins

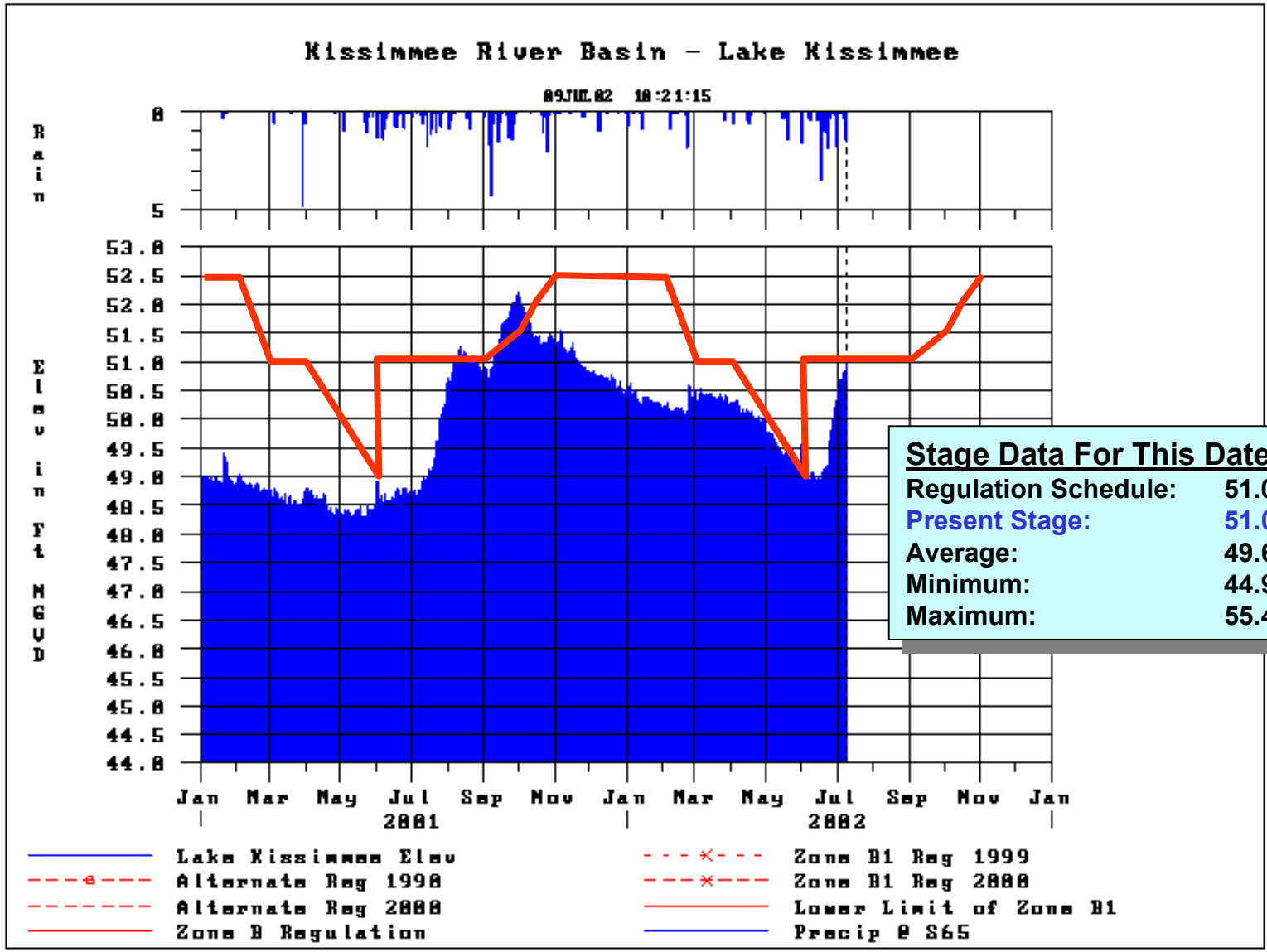
- All lakes are at or above their regulation schedule
  - This condition is in response to heavy wet season rainfall
  - With the exception of Lake Kissimmee, all lakes are currently making regulatory releases
- Minor environmental releases (~300 - 400 cfs) from Lake Kissimmee through June
  - Current regulatory releases: ~2,400 cfs
  - Expected to increase with additional rainfall




Kissimmee - Lakes Trout, Coon, Center, Lizzie & Alligator
09JUL02 09:33:49
Rain
Elev in Ft NGVD
0
5
65
64
63
62
61
60
59
58
57
56
55
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2001
2002
Stage Data For This Date:
Regulation Schedule: 63.20
Present Stage: 63.04
Average: 62.08
Minimum: 58.89 (2001)
Maximum: 65.62 (1942)
Lake Alligator Elev
S-68 Elev-Head
S-58 Elev-Head
Alternate Regulation
Temporary Deviation
Zone B Regulation
Precip @ Kissimmee Field Statio


Kissimmee River Basin - East Lake Tohopekaliga
09JUL02 10:03:10
Rain
0
5
Elev in Ft NGVD
60.0
59.5
59.0
58.5
58.0
57.5
57.0
56.5
56.0
55.5
55.0
54.5
54.0
53.5
53.0
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2001
2002
East Lake Tohopekaliga Elev
Precip @ Kissimmee Field Statio
Alternate Regulation
Zone B Regulation
Zone B1 Regulation
Stage Data For This Date:
Regulation Schedule: 56.50
Present Stage: 57.29
Average: 55.46
Minimum: 52.10 (1962)
Maximum: 58.61 (1974)

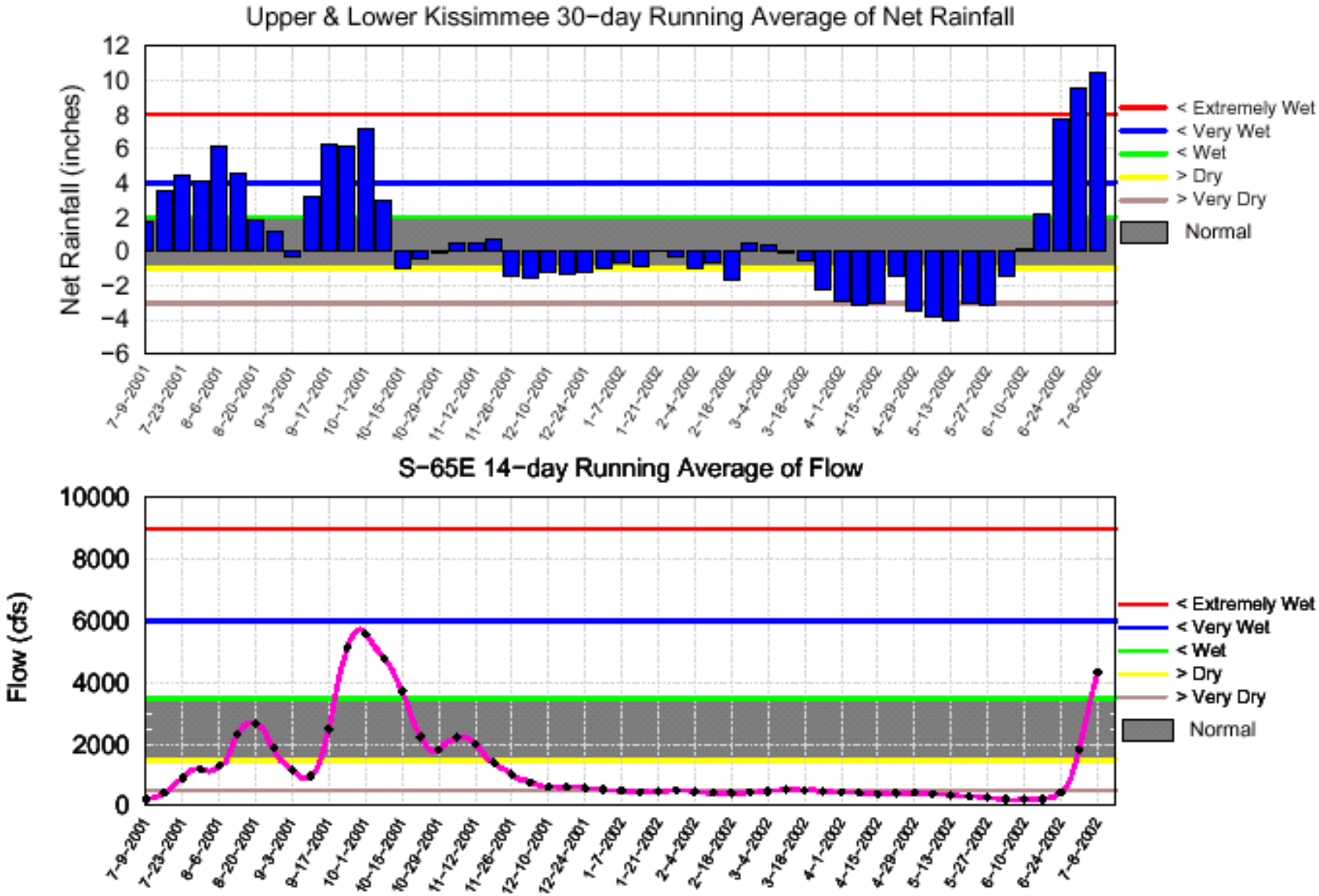

Kissimmee River Basin – Lake Tohopekaliga
09JUL02 10:20:16
Rain
0
2
4
Elev in Ft NGVD
56.0
55.5
55.0
54.5
54.0
53.5
53.0
52.5
52.0
51.5
51.0
50.5
50.0
49.5
49.0
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2001
2002
Lake Tohopekaliga
Precip @ S-61
Alternate Regulation
Zone B Regulation
Zone B1 Regulation
Stage Data For This Date:
Regulation Schedule: 53.50
Present Stage: 54.88
Average: 52.72
Minimum: 48.68 (1971)
Maximum: 55.93 (1947)



Stage Data For This Date:

Regulation Schedule:	51.00
Present Stage:	51.07
Average:	49.65
Minimum:	44.94 (1962)
Maximum:	55.40 (1930)

Tributary Basin Condition Indicators as of July 8, 2002

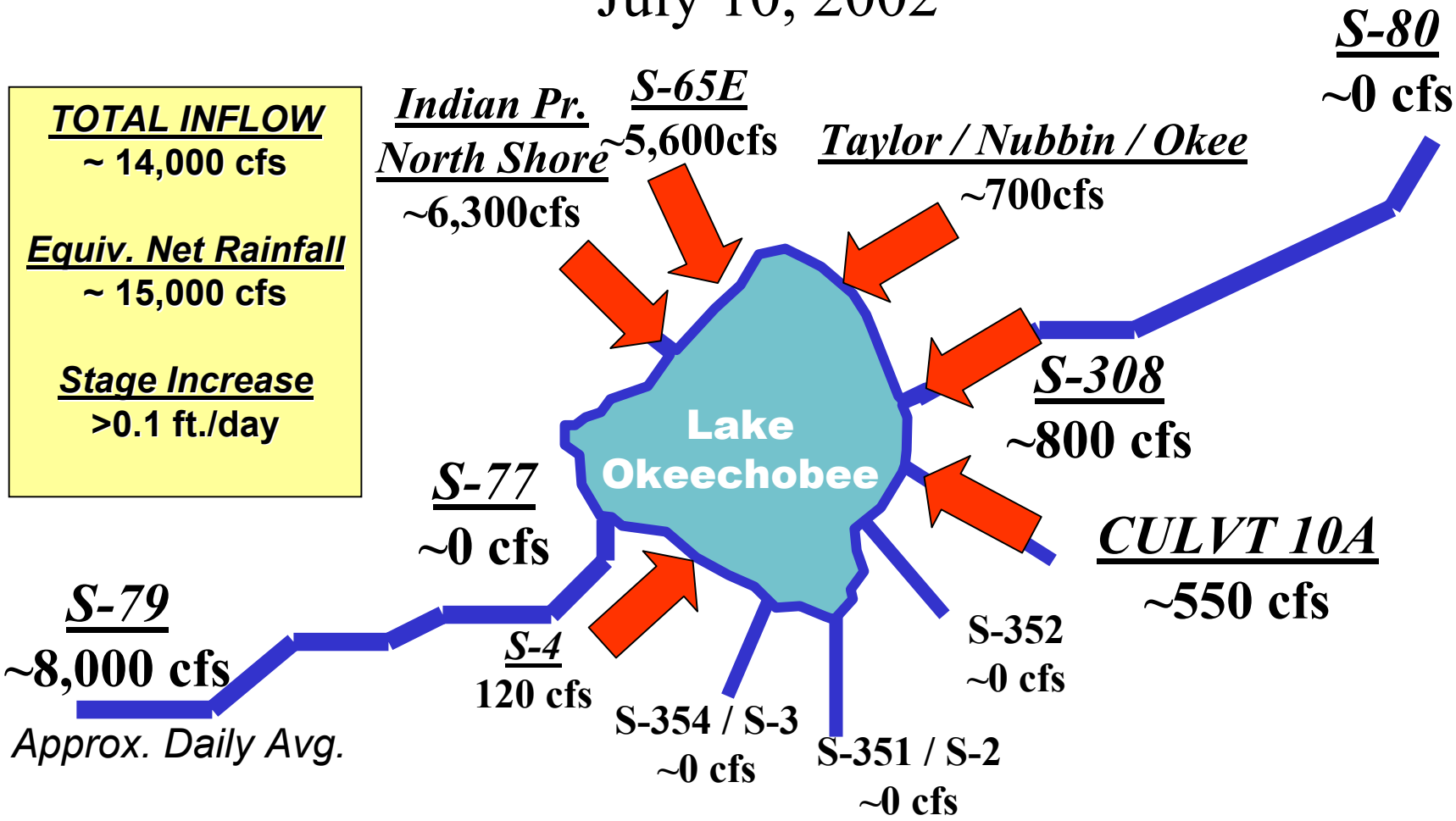


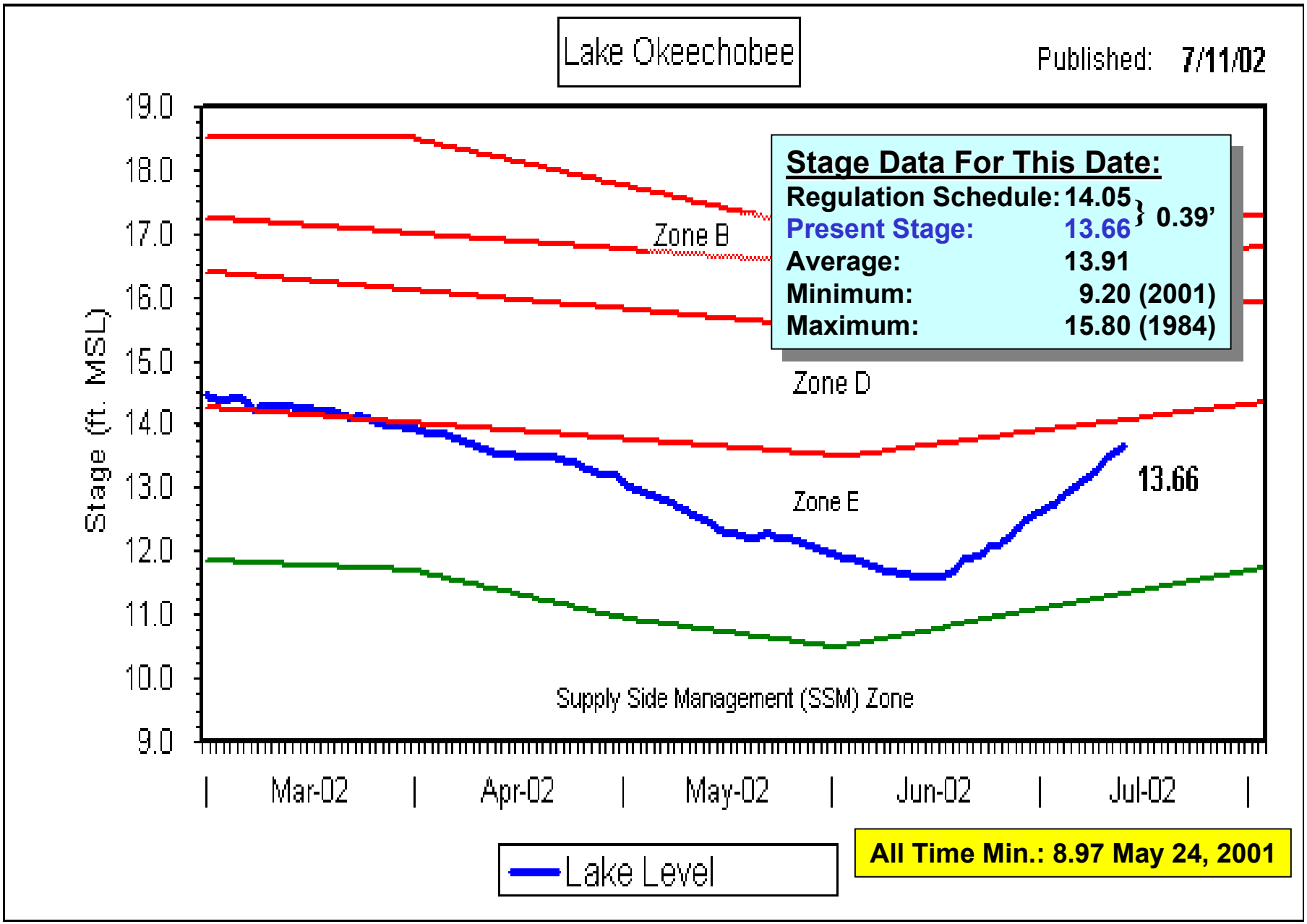
Hydrologic Conditions
Lake Okeechobee

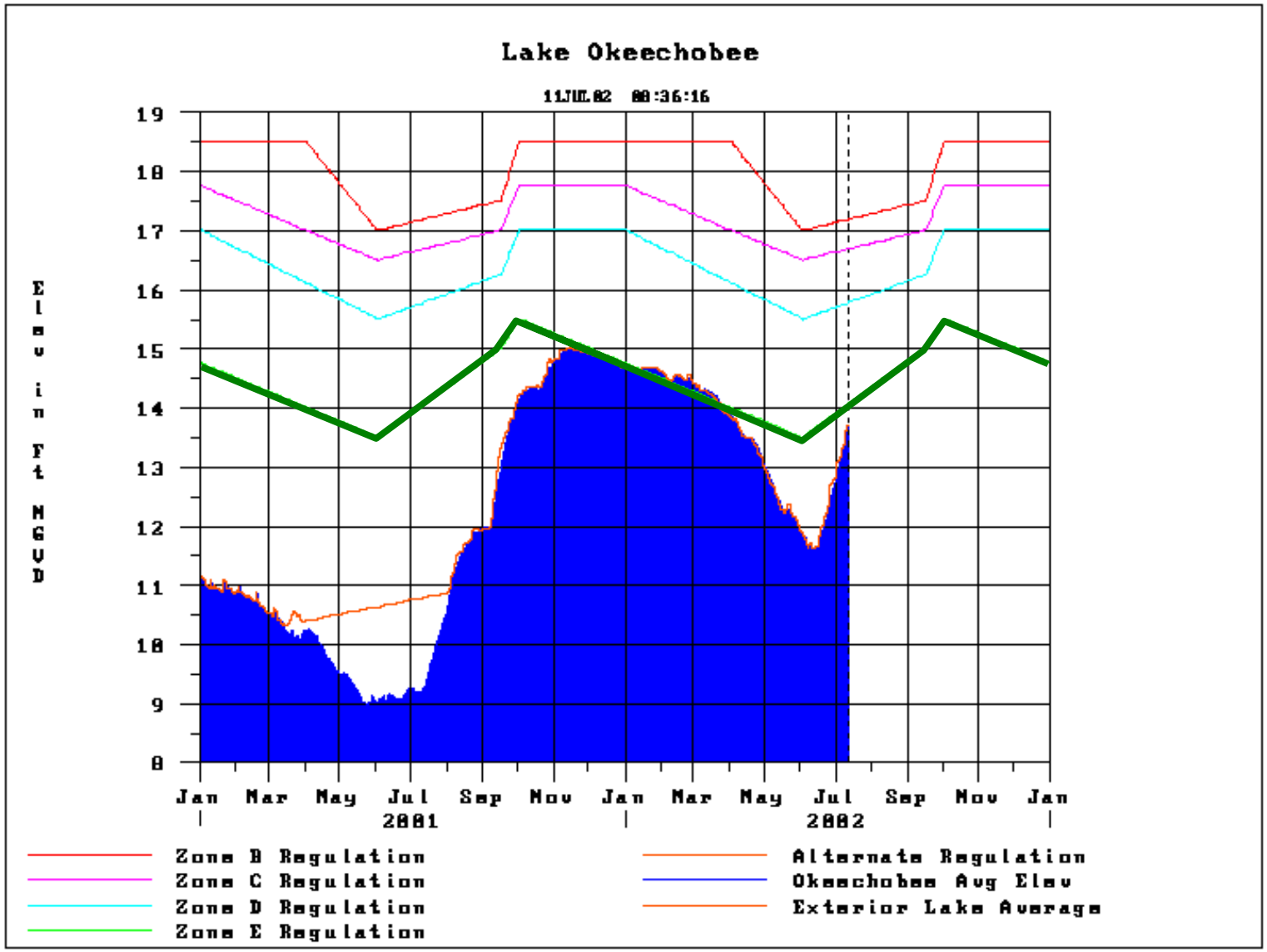
- Lake Okeechobee stages have risen sharply in response to near record wet season rainfall over the past month
- Regulatory releases from the Upper Chain of Lakes and Kissimmee River inflows are expected to continue this trend of rising stages in the near term

Estimated Lake Okeechobee Inflows

July 10, 2002




Lake Okeechobee
Published: 7/11/02
Stage Data For This Date:
Regulation Schedule: 14.05
Present Stage: 13.66
0.39'
Average: 13.91
Minimum: 9.20 (2001)
Maximum: 15.80 (1984)
Zone B
Zone D
Zone E
13.66
Supply Side Management (SSM) Zone
Stage (ft. MSL)
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
Mar-02
Apr-02
May-02
Jun-02
Jul-02
Lake Level
All Time Min.: 8.97 May 24, 2001


Lake Okeechobee
11/11.02 08:36:16
Elev in Ft NGVD
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Jan
2001
2002
Zone B Regulation
Zone C Regulation
Zone D Regulation
Zone E Regulation
Alternate Regulation
Okeechobee Avg Elev
Exterior Lake Average

Lake Okeechobee Current Operations

- **Lake Okeechobee Regulation Schedule (WSE)**
  - **Stages presently in Zone E**
  - Above normal Kissimmee River inflows
  - Extremely wet rainfall
  - Wet seasonal forecast
  - Wet multi-seasonal forecast
- No required regulatory discharge to the WCAs
- No required regulatory discharge to estuaries

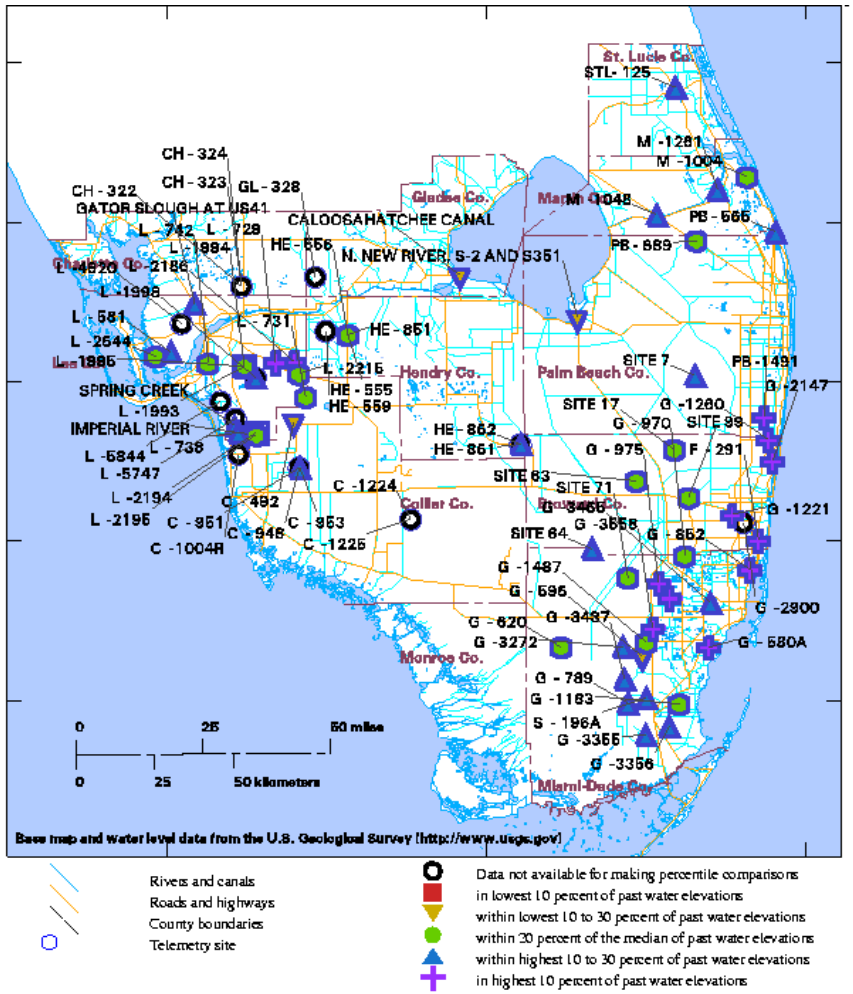
Lake Okeechobee Agricultural Areas

- Stormwater Treatment Areas
  - Occasional diversions occurred in June
    - STA 1W, 2 & 5
      - Mechanical Issues (STA 1W & 5)
      - Mercury Issues (STA 2)
- Lake Okeechobee Backpumping
  - June 26th rainfall event increased Miami Canal stages above flood control trigger (13 ft. NGVD)
  - Because the lake was low, this allowed gravity backflow at S-354 in lieu of pumping at S-3
    - Only 34 ac-ft were discharged to the lake

Hydrologic Conditions

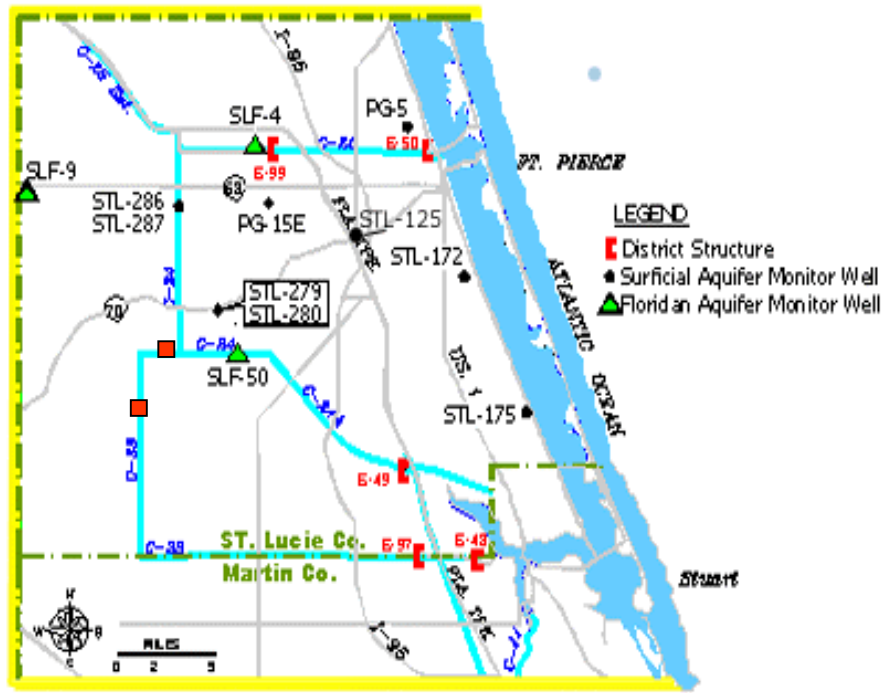
Groundwater Conditions

- Upper East Coast, Lower East Coast
  - Above normal seasonal levels
- Lower West Coast Region:
  - Above normal seasonal levels



Upper East Coast

- Water levels in the C-23, C-24 & C-25 canals are normal
  - Significant flood discharges made over the past month in response to above average rainfall

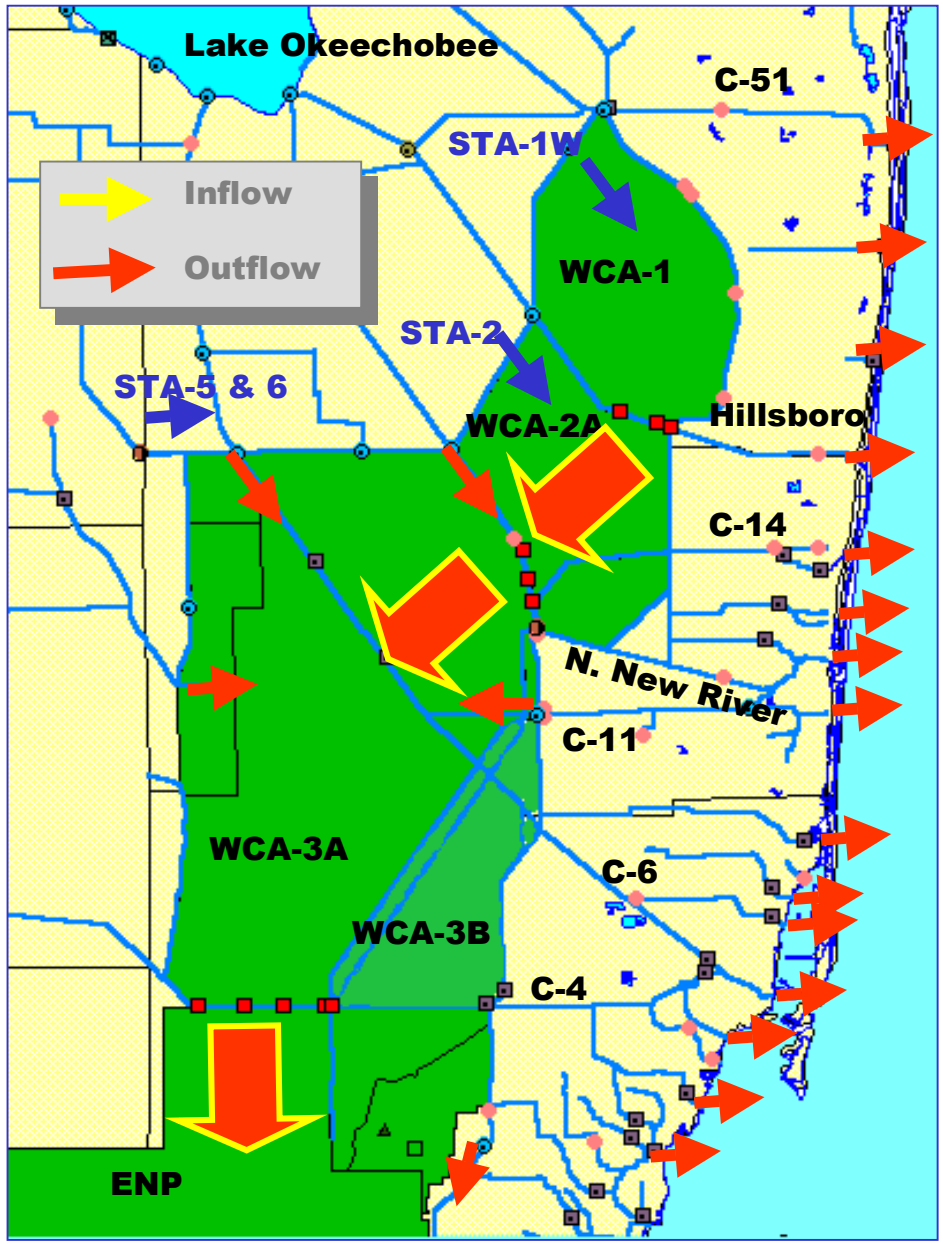


Lower East Coast

- All coastal canals have been making flood releases through June
- Coastal structures in Miami-Dade County have been in their pre-storm low range for almost 3 weeks

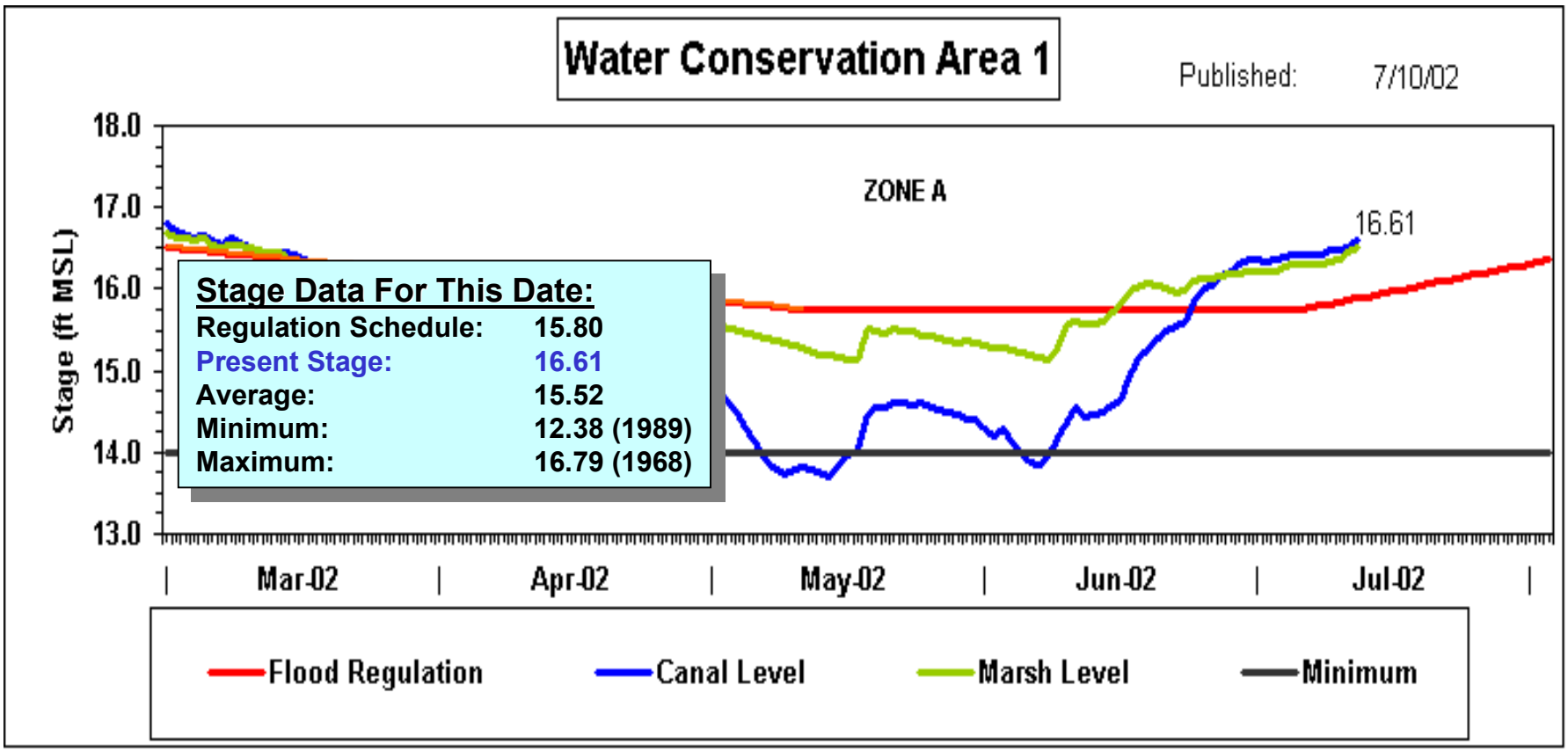
Water Conservation Areas

- WCA stages are currently above regulation schedules
- Regulatory releases currently being made
  - WCA-1
  - WCA-2A
  - WCA-3A



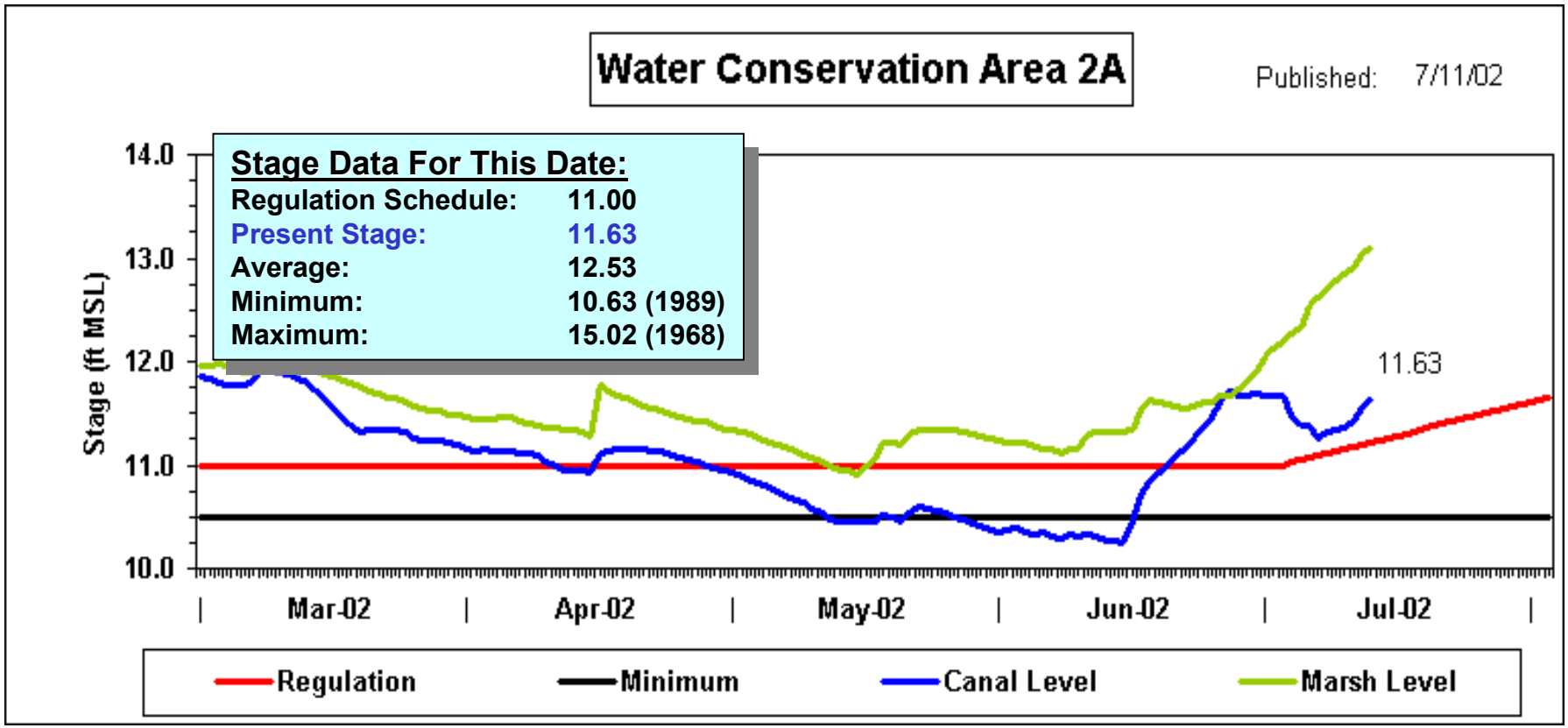
Hydrologic Conditions
Water Conservation Areas

- Stages rose from the environmental floor into Zone A of the regulation schedule within the month of June



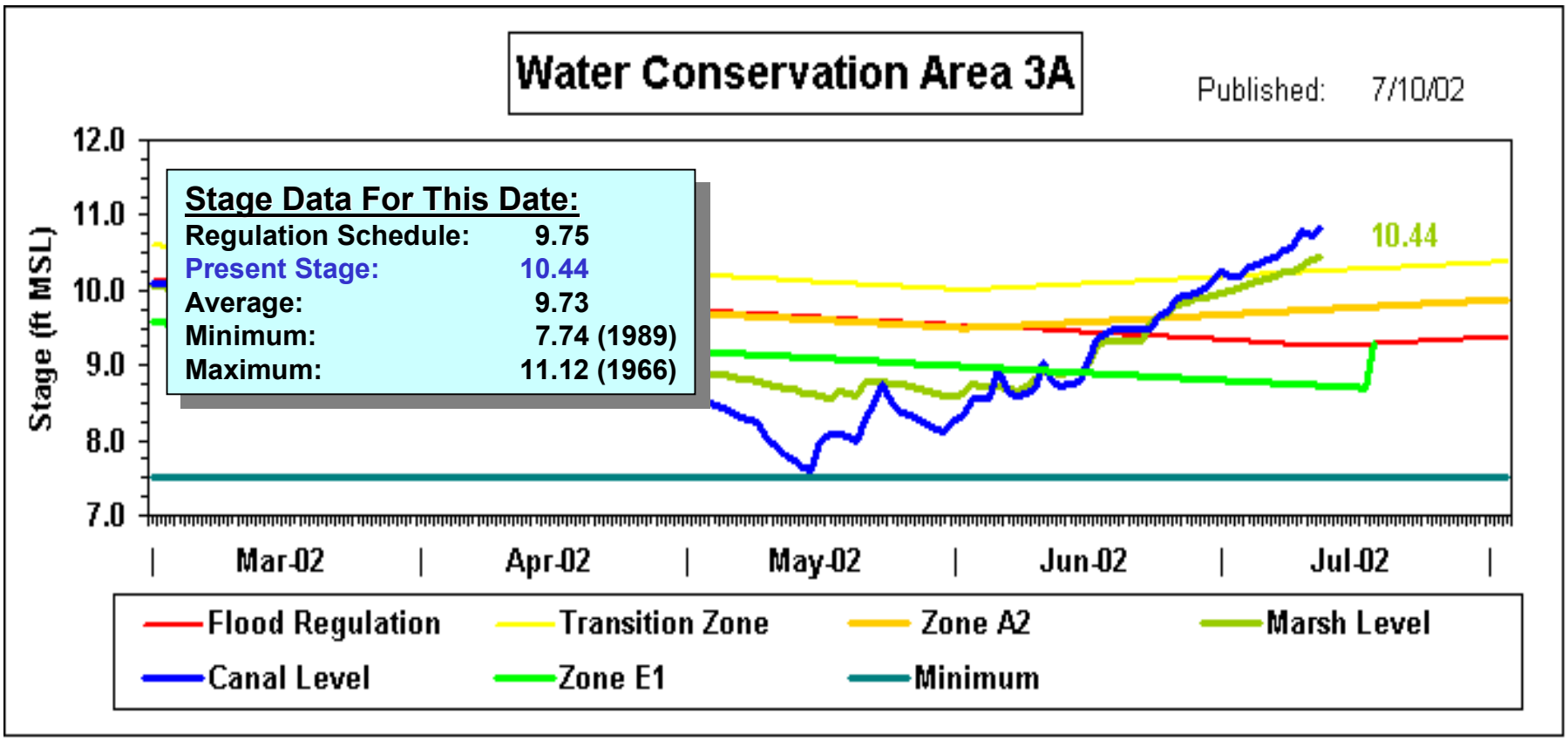
Hydrologic Conditions
Water Conservation Areas

- Stages rose from the environmental floor into Zone A of the regulation schedule within the month of June



Hydrologic Conditions
Water Conservation Areas

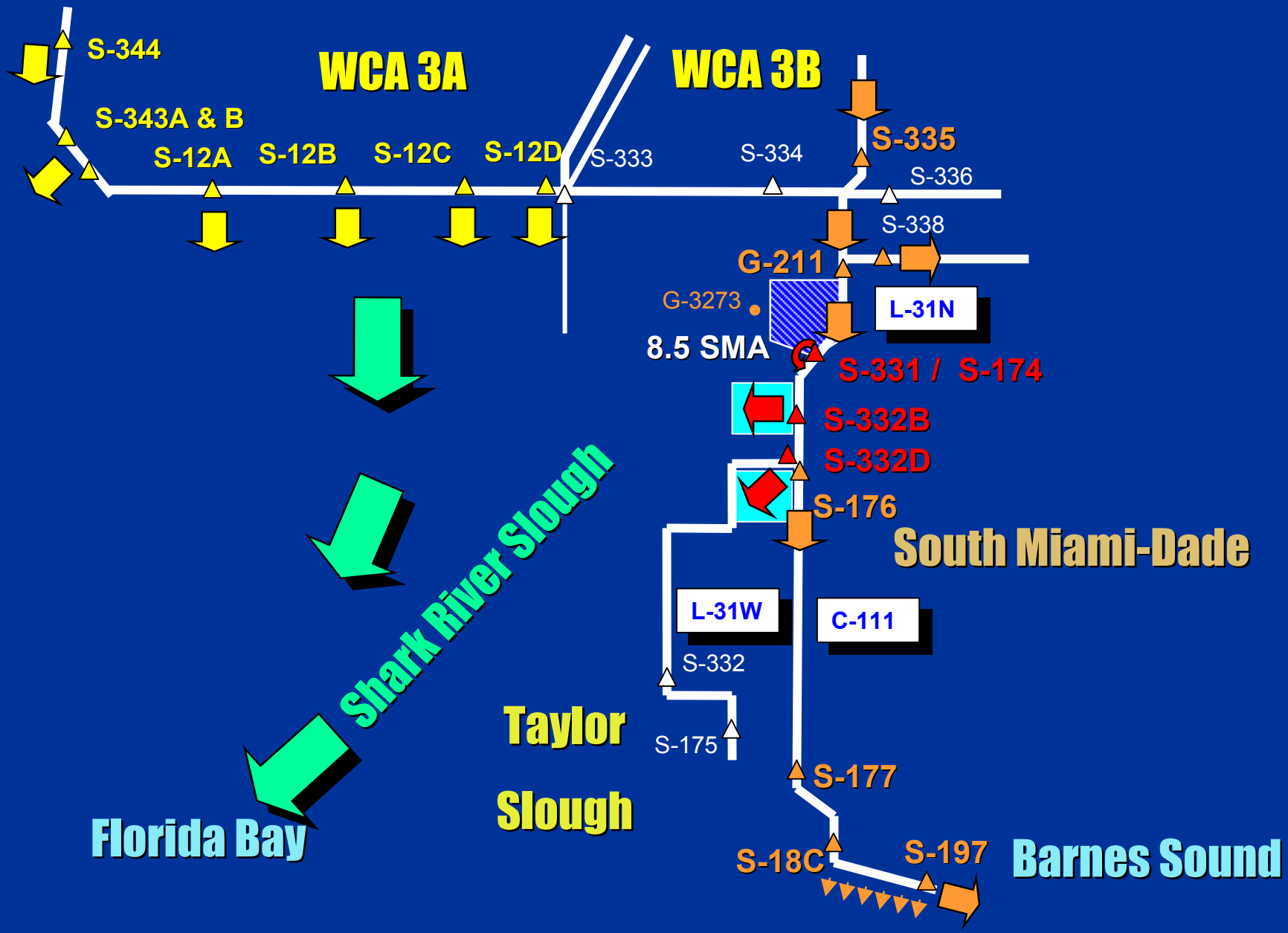
- Stages in Zone A of regulation schedule



Hydrologic Conditions
SDCS Current Operations

- Record of Decision (ROD) on the IOP EIS was approved by the USCAE on July 3, 2002
- ISOP 2001 criteria remains in place until USACE completes initial implementation efforts
  - Water Quality Certification
  - Pump station reliability testing
- Recent rains have required the opening of S-197
  - 3 gates of 13:
    - 7,890 acre feet for an 8-day period (June 21-28)
    - 3 gates opened again on July 9th, and remain open in response to recent rainfall

SDCS - ISOP 2001 July Operations

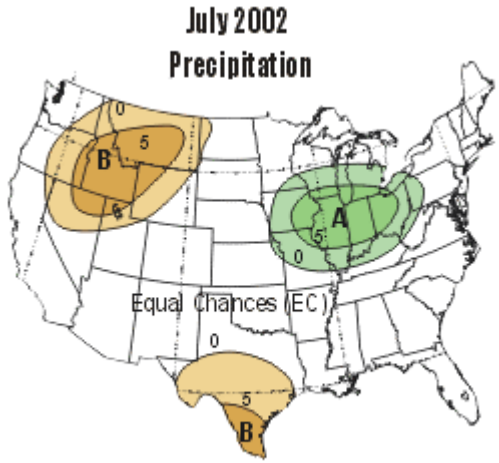


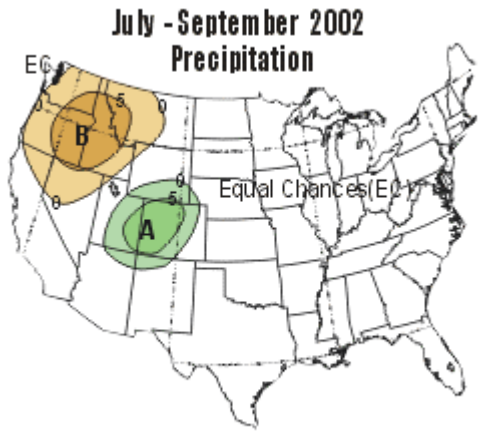
Climate Outlook

Governing Board Presentation - July 11, 2002

Seasonal Climatic Outlook

- CPC reports that the period from July to September 2002 has no increased probability for either above or below average precipitation





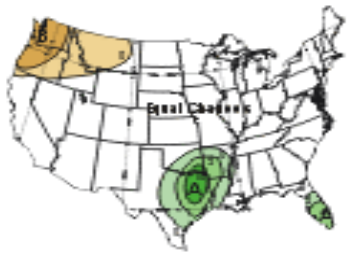
Release Date: June 13, 2002

Seasonal Outlook **Precipitation** Release Date: June 13, 2002

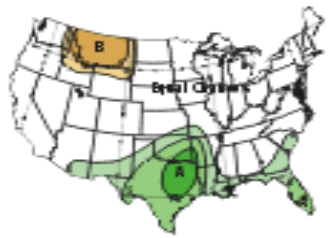
August - October 2002

September - November 2002

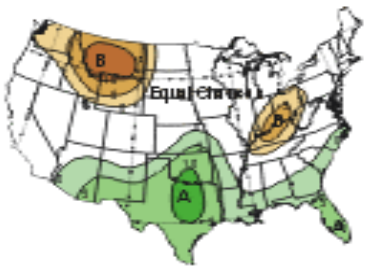
October - December 2002



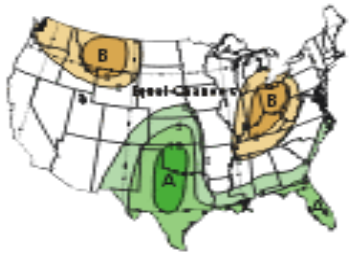
November 2002 - January 2003



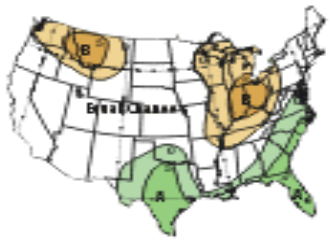
December 2002 - February 2003



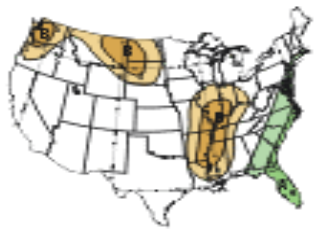
January - March 2003



February - April 2003



March - May 2003



April - June 2003

May - July 2003

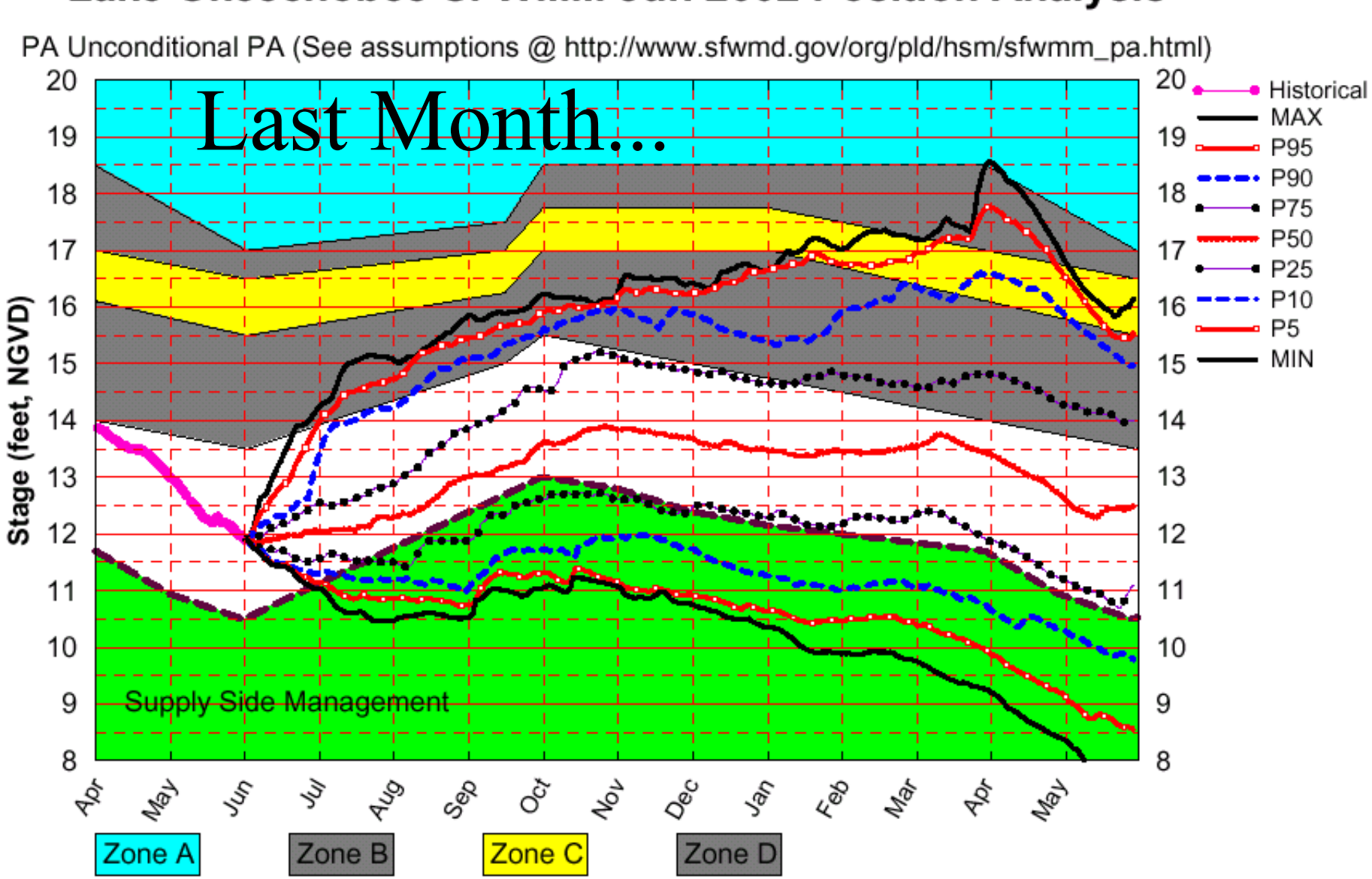
June - August 2003

July - September 2003

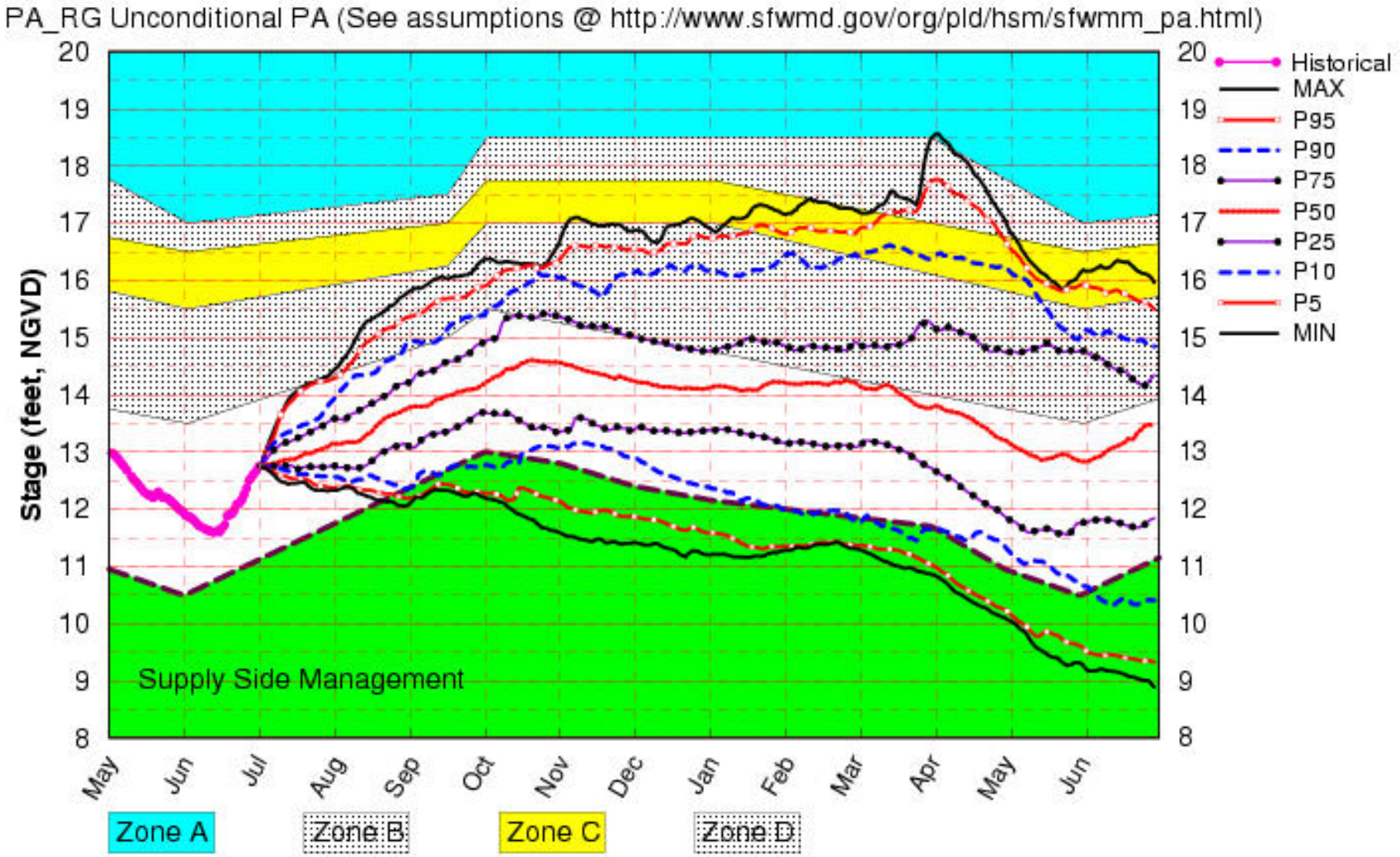
Hydrologic Outlook

Governing Board Presentation - July 11, 2002

Lake Okeechobee SFWMM Jun 2002 Position Analysis



Lake Okeechobee SFWMM Jul 2002 Position Analysis



Lake Okeechobee Operational Outlook

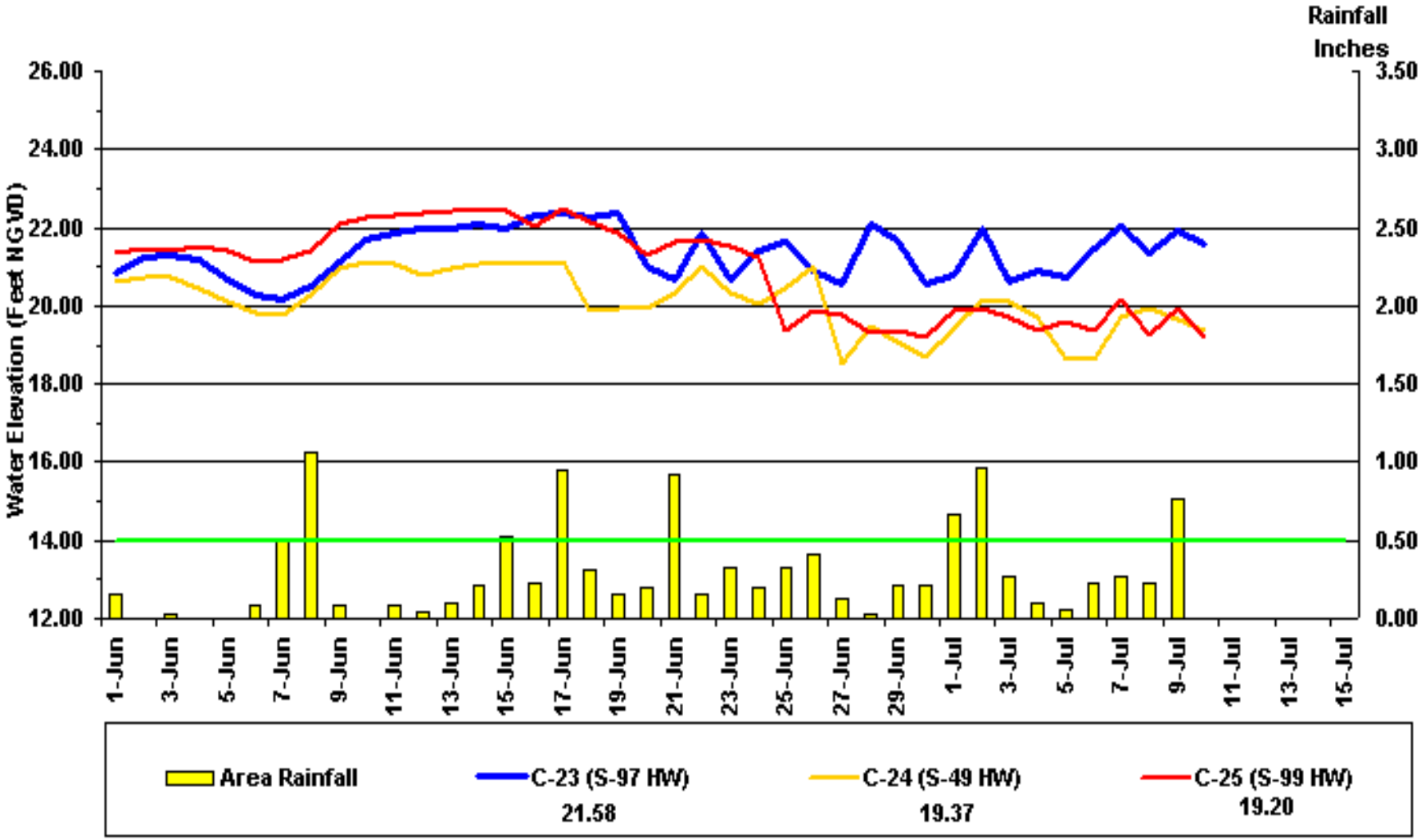
- Lake is rapidly approaching Zone D
  - Expect to cross into Zone D within the next week
- Very wet tributary conditions and heavy local rainfall
- The lake regulation schedule will lead USACE / SFWMD to initiate Pulse Releases to the Caloosahatchee and St. Lucie Estuary
  - Pulse Releases mimic a more natural inflow pattern than a constant discharge pattern
  - Pulse Flow Range:
    - Caloosahatchee: 0 - 4,500 cfs (peak flow)
    - St. Lucie: 0 - 2,500 cfs (peak flow)

Lake Okeechobee Operational Outlook

- Early pulse releases to the estuaries reduces the rate of increasing lake stages and may reduce the need to make large more damaging releases later in the hurricane season
- Based on the current projection of rainfall and inflow, Staff is evaluating the possibility of making early low level pulse releases to the Caloosahatchee and St. Lucie estuaries prior to entering Zone D
  - Requesting Governing Board concurrence

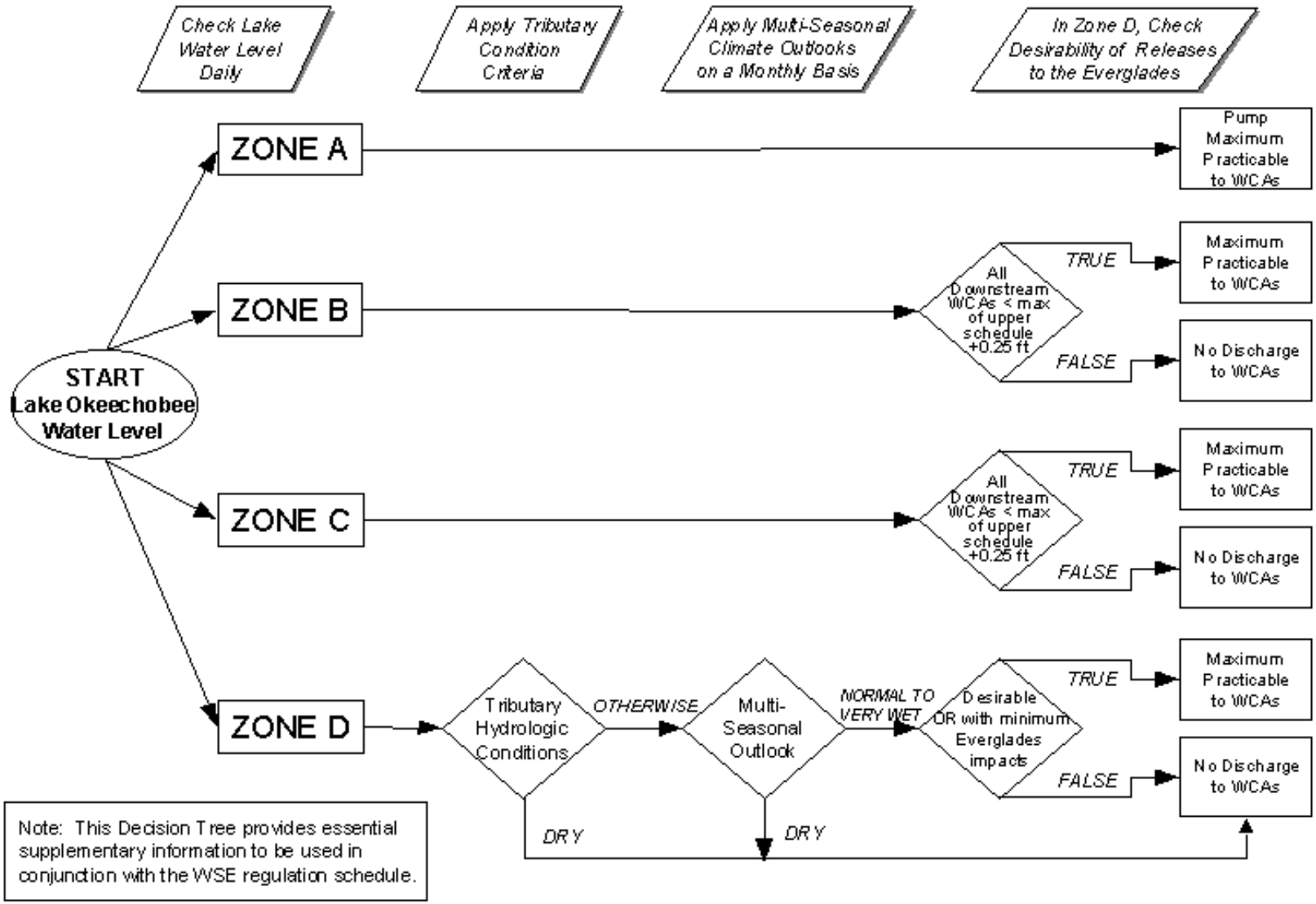
Governing Board Presentation - July 11, 2002

Upper East Coast
Structures on C-23, C-24 & C-25



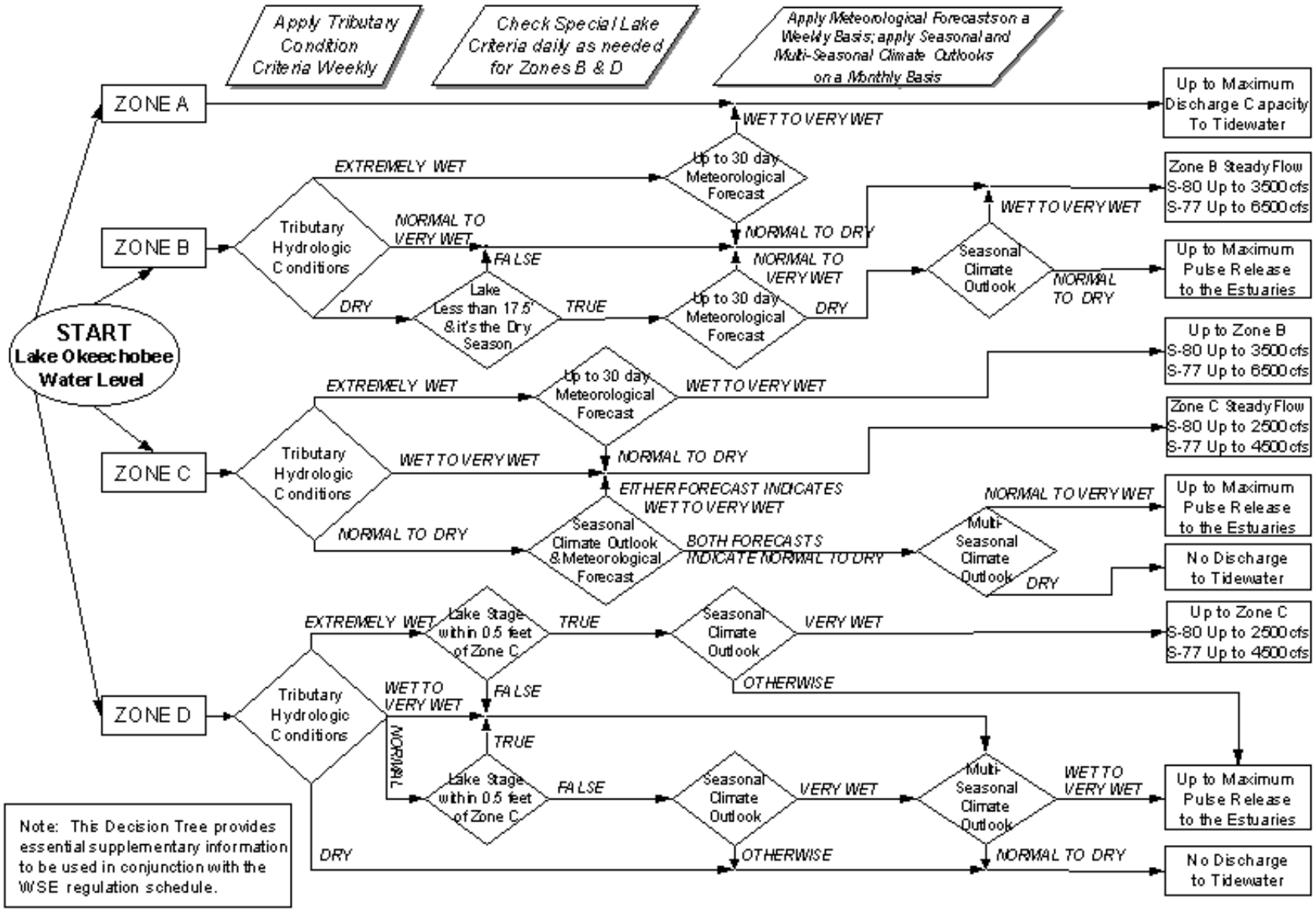
WSE Operational Guidelines Decision Tree

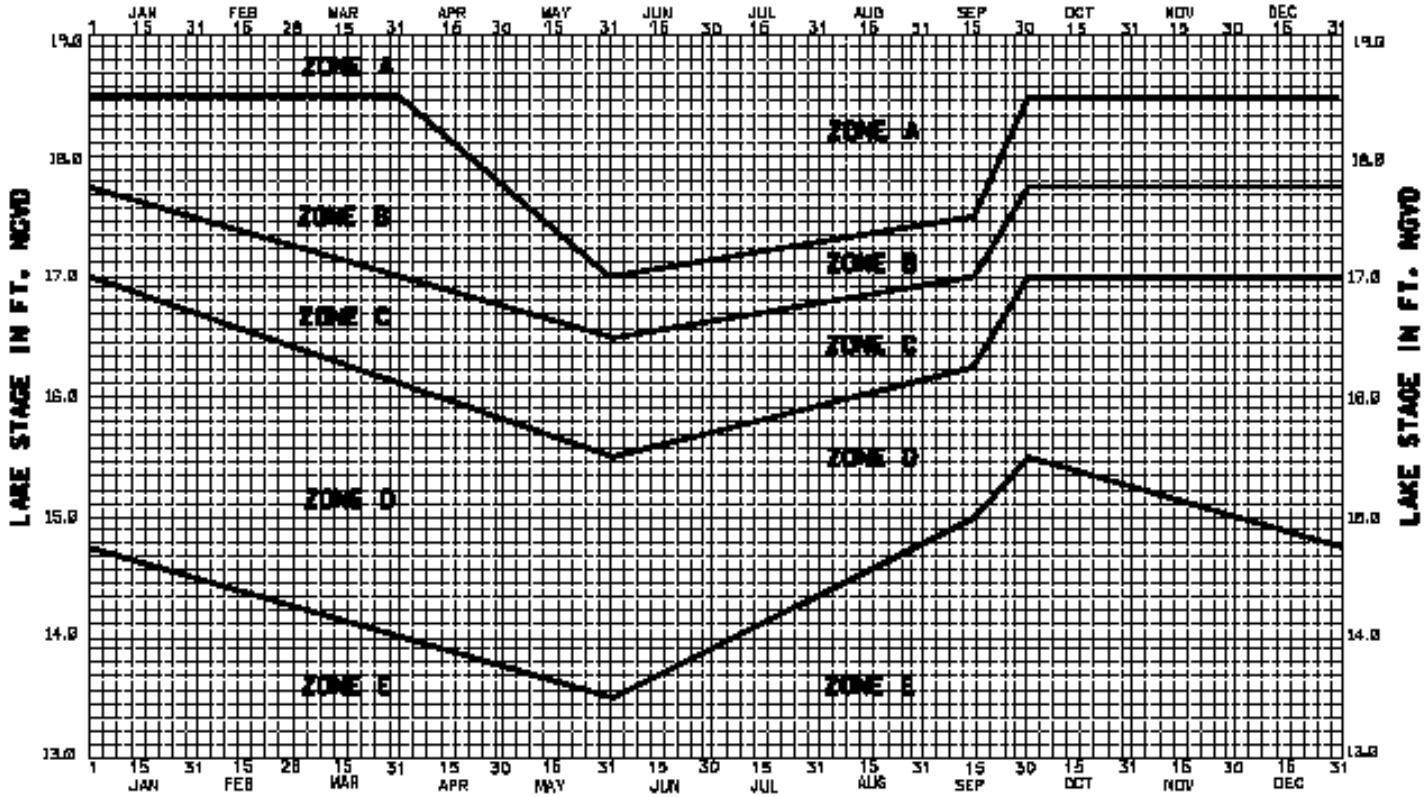
Part 1: Define Lake Okeechobee Discharges to the Water Conservation Areas



WSE Operational Guidelines Decision Tree

Part 2: Define Lake Okeechobee Discharges to Tidewater (Estuaries)





RELEASE THROUGH OUTLETS AS INDICATED

ZONE	AGRICULTURAL CANALS To WCAs (1,2)	CALOOSAHATCHEE RIVER AT S-77 (1,2,4)	ST. LUCIE CANAL AT S-80 (1,2,4)
A	PUMP MAXIMUM PRACTICABLE	UP TO MAXIMUM CAPACITY	UP TO MAXIMUM CAPACITY
B (3)	MAXIMUM PRACTICABLE RELEASES	RELEASES PER DECISION TREE (THESE CAN RANGE FROM MAXIMUM PULSE RELEASE UP TO MAXIMUM CAPACITY)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM MAXIMUM PULSE RELEASE UP TO MAXIMUM CAPACITY)
C (3)	MAXIMUM PRACTICABLE RELEASES	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 6500 CFS)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 3500 CFS)
D (3,5)	AS NEEDED TO MINIMIZE ADVERSE IMPACTS TO THE LITTORAL ZONE WHILE NOT ADVERSELY IMPACTING THE EVERGLADES. (SEE NOTE 5.)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 4500 CFS)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 2500 CFS)
E	NO REGULATORY DISCHARGE	NO REGULATORY DISCHARGE	NO REGULATORY DISCHARGE

NOTES: (1) SUBJECT TO FIRST REMOVAL OF RUNOFF FROM DOWNSTREAM BASINS
(2) GUIDELINES FOR WET, DRY AND NORMAL CONDITIONS ARE BASED ON: 1) SELECTED CLIMATIC INDICES AND TROPICAL FORECASTS AND 2) PROJECTED INFLOW CONDITIONS. RELEASES ARE SUBJECT TO THE GUIDELINES IN THE WSE OPERATIONAL DECISION TREE, PARTS 1 AND 2.
(3) RELEASES THROUGH VARIOUS OUTLETS MAY BE MODIFIED TO MINIMIZE DAMAGES OR OBTAIN ADDITIONAL BENEFITS. CONSULTATION WITH EVERGLADES AND ESTUARINE BIOLOGISTS IS ENCOURAGED TO MINIMIZE ADVERSE EFFECTS TO DOWNSTREAM ECOSYSTEMS.
(4) PULSE RELEASES ARE MADE TO MINIMIZE ADVERSE IMPACTS TO THE ESTUARIES
(5) ONLY WHEN THE WCAs ARE BELOW THEIR RESPECTIVE SCHEDULES

CENTRAL AND SOUTHERN FLORIDA
INTERIM REGULATION SCHEDULE
LAKE OKEECHOBEE

DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT
CORPS OF ENGINEERS, JACKSONVILLE, FLORIDA
DATED: 5 NOVEMBER 1999

WSE (WITH CLIMATE OUTLOOK)